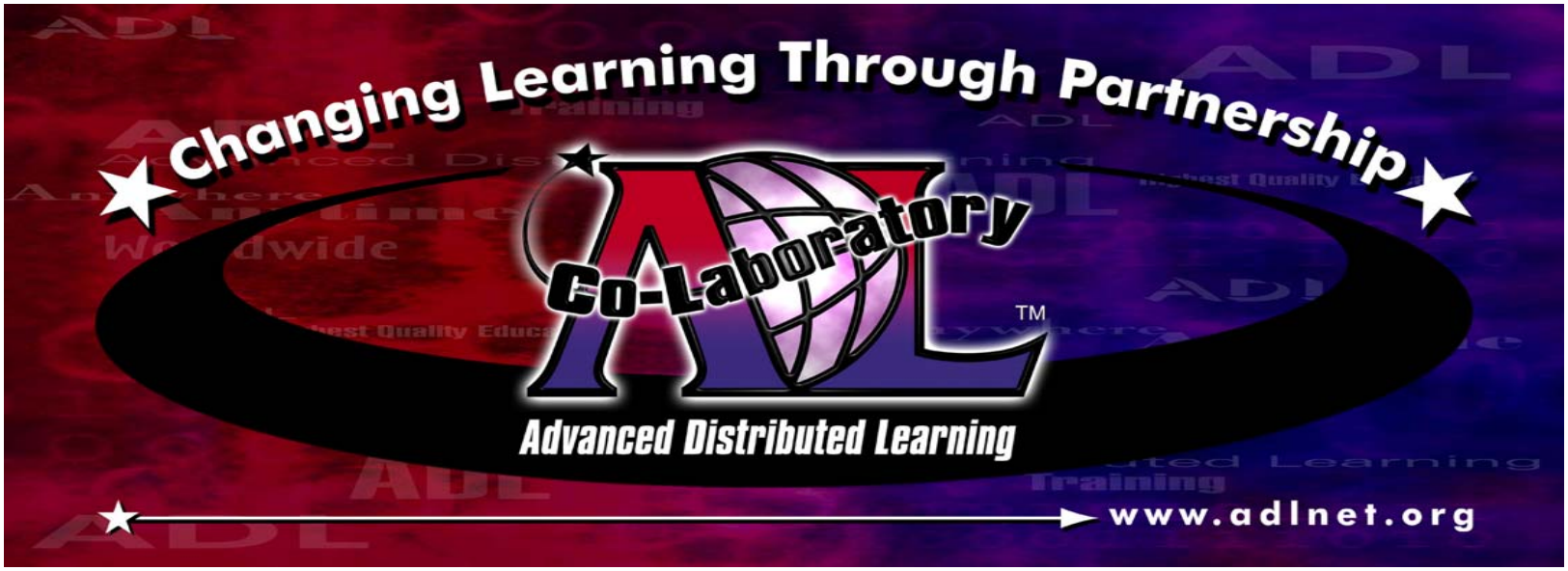
ADL & SCORM 2004
CDC-PHIN

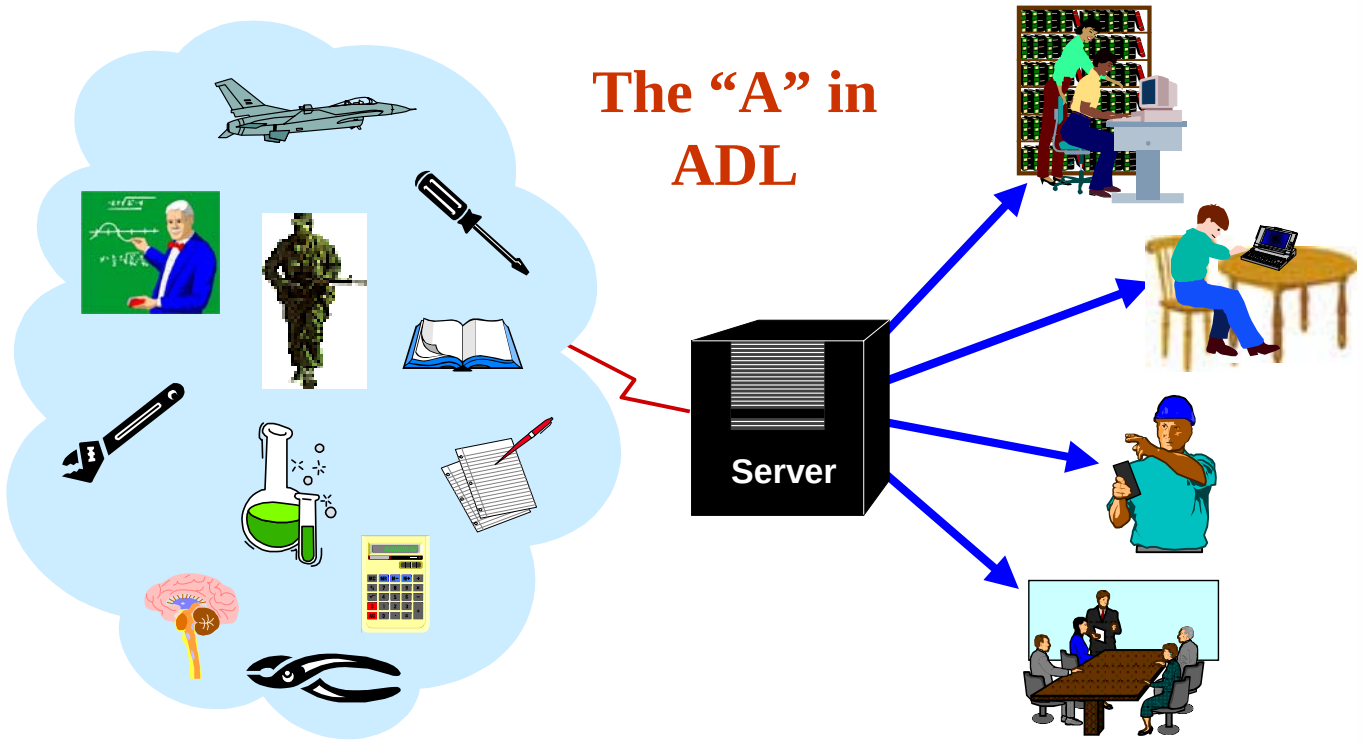


Paul Jesukiewicz

ADL Co-Lab

May 25, 2004

The ADL Initiative Vision

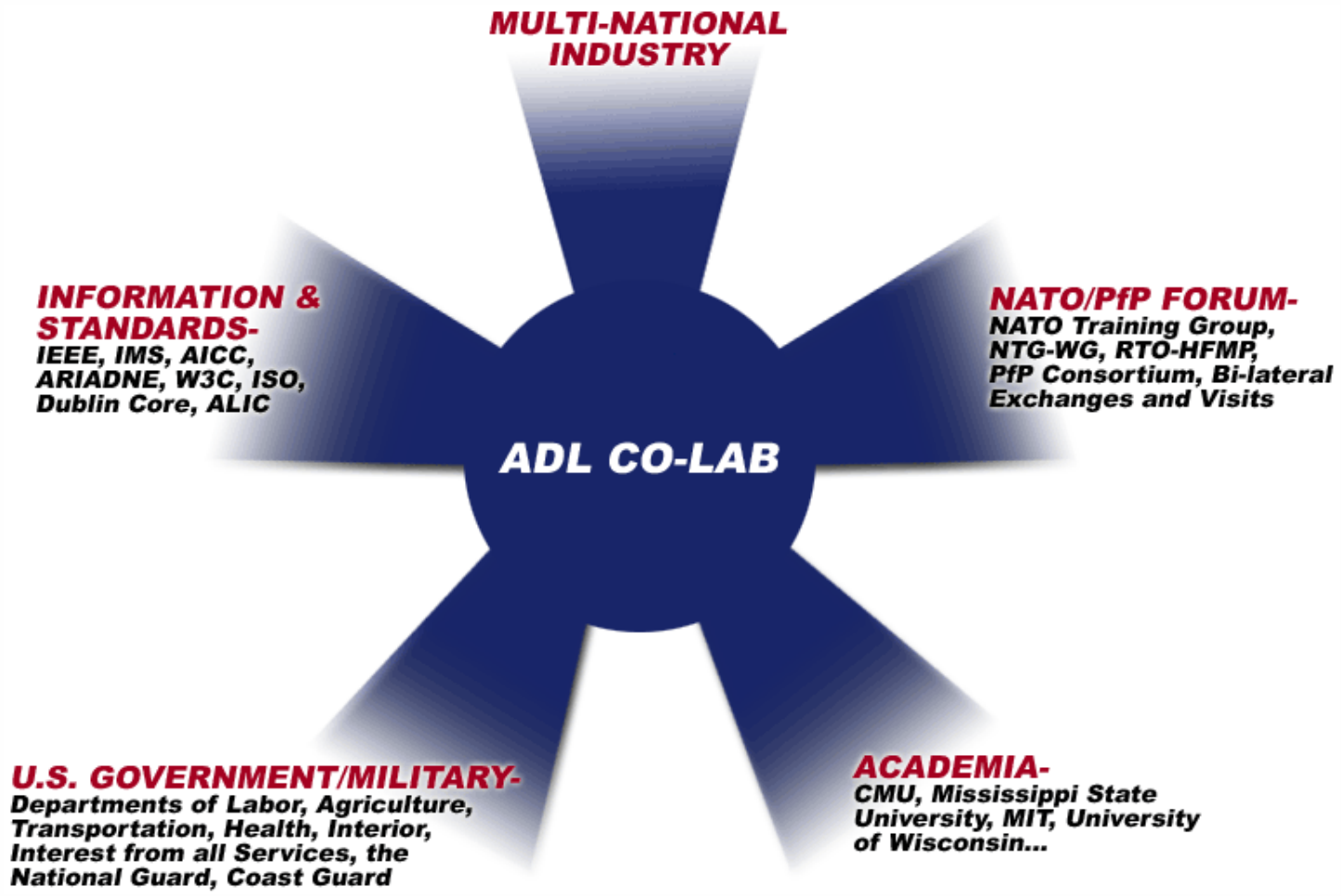


Sharable Content Objects from across the World Wide Web

Assembled in real-time, on-demand

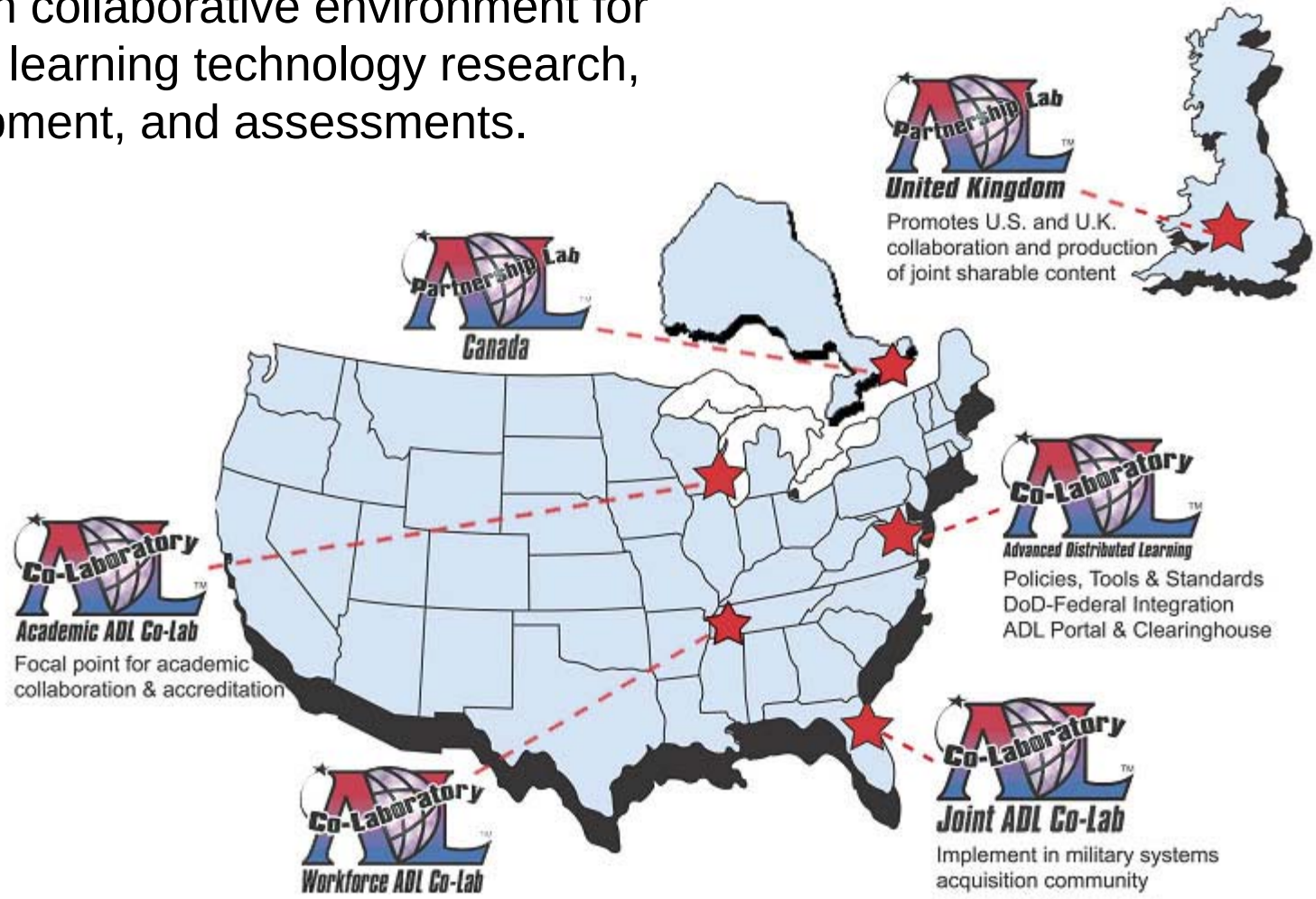
To provide learning and assistance anytime, anywhere

ADL Communities



ADL Co-Labs and Partnership Labs

An open collaborative environment for sharing learning technology research, development, and assessments.



Web-based Learning Content Issues

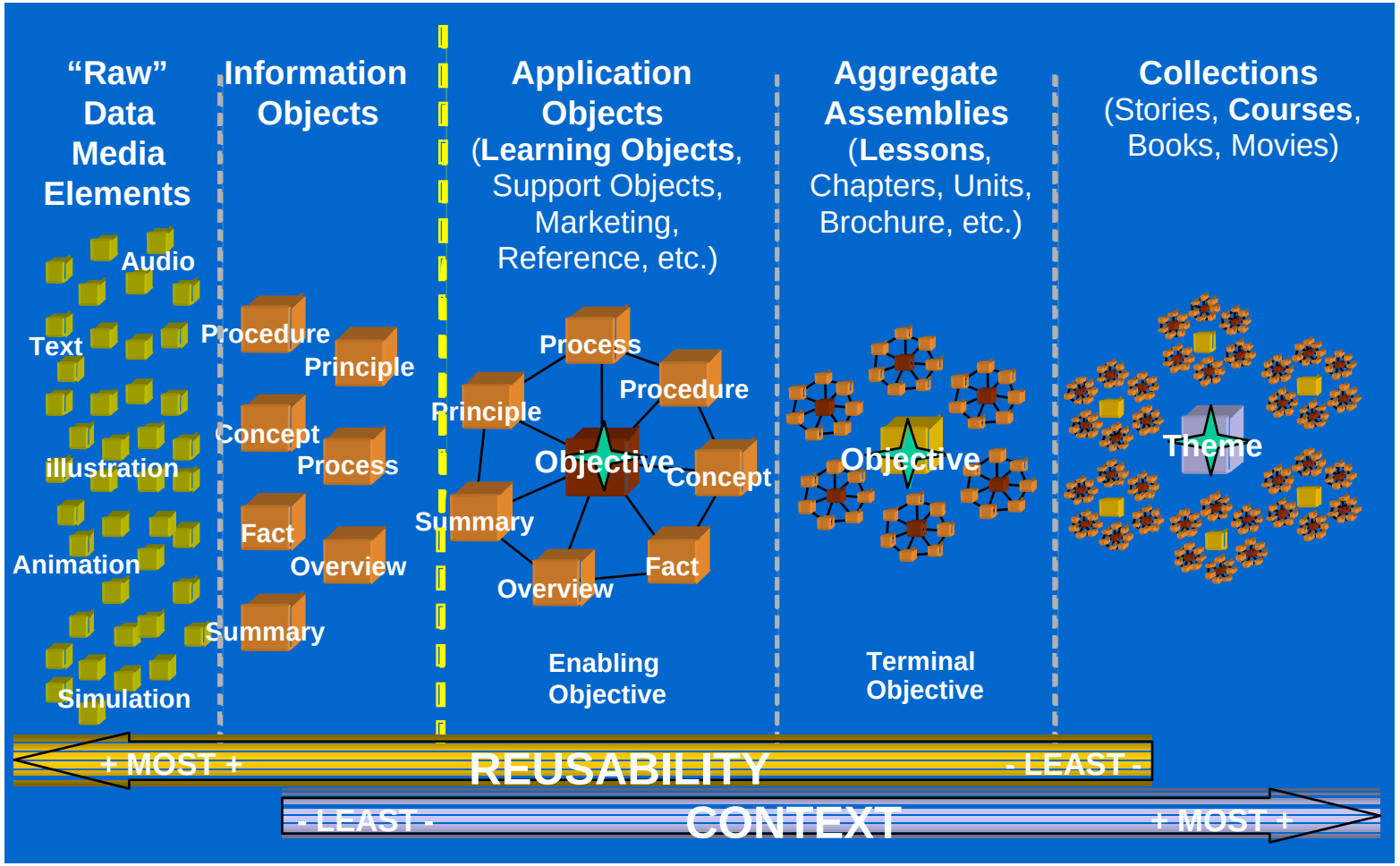
- ✓ Couldn't move a web-based course from one Learning Management System (server) to another
- ✓ Couldn't reuse web-based content pieces (learning objects) across different LMS systems
- ✓ Couldn't create directed learning strategies (e.g., branching, remediation, etc.)
- • Can't create searchable learning object libraries or media repositories across different LMS environments
- • ……. Work in progress w/ CNRI, DTIC, LOC, CMU, NSF Digital Libraries project, others

SCORM™

Sharable Content Object Reference Model

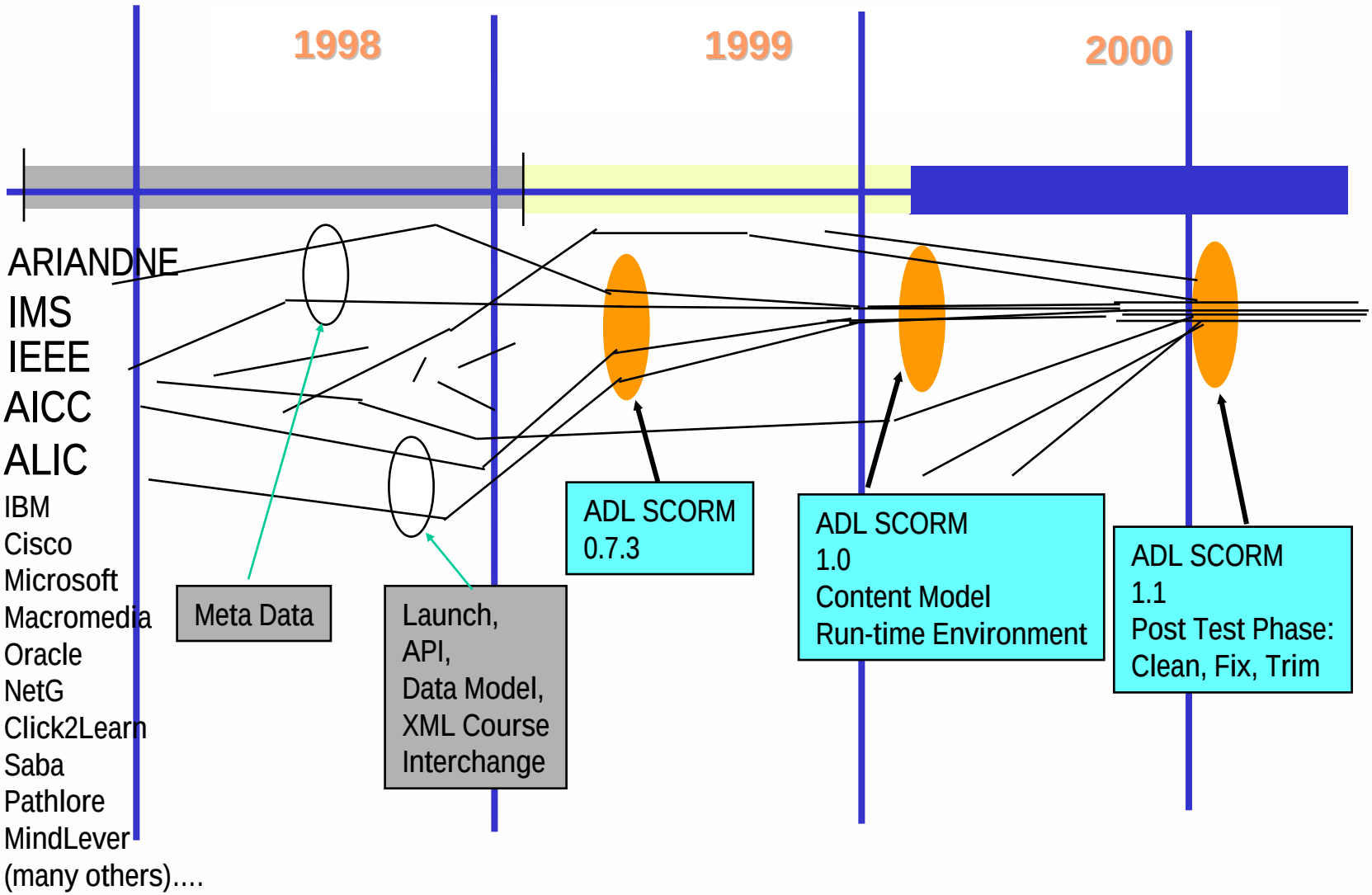
A software model that defines the interrelationship of course components, data models, and protocols such that content “objects” are sharable across systems that conform with the same model.

Reusable Learning Objects

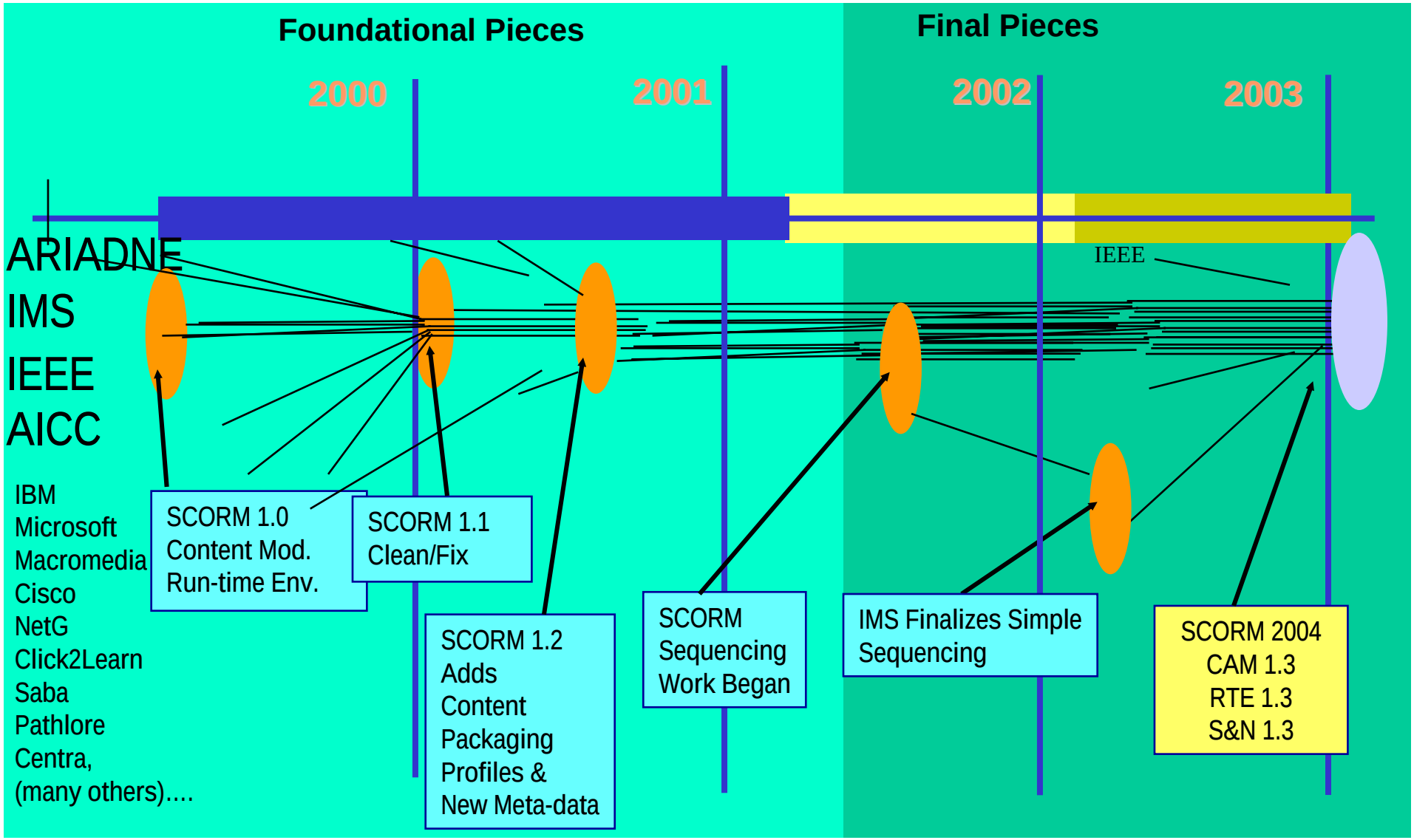


Source: Autodesk

ADL -- Convergence of Interests



SCORM Core Complete



AICC + IEEE + IMS + ADL = SCORM

Many, many long technical meetings

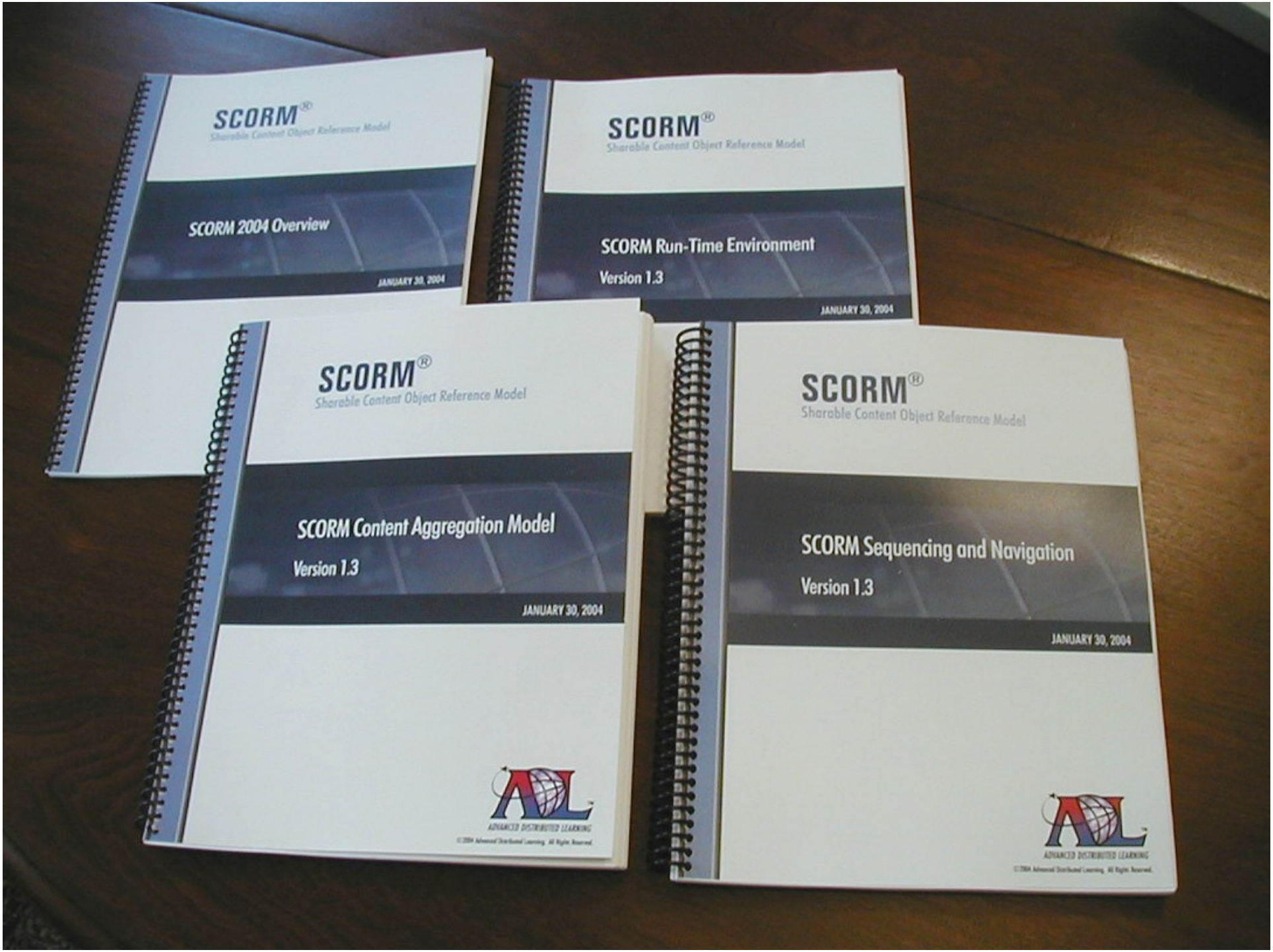
IEEE Meetings
Late 1999
Partial list of participants:
Microsoft
Sun
Boeing
Oracle
Cisco
IBM

Click2Learn, Avilar, Pathlore, Saba, NETg, SmartForce, Centra, Thinq, Macromedia, and many more…

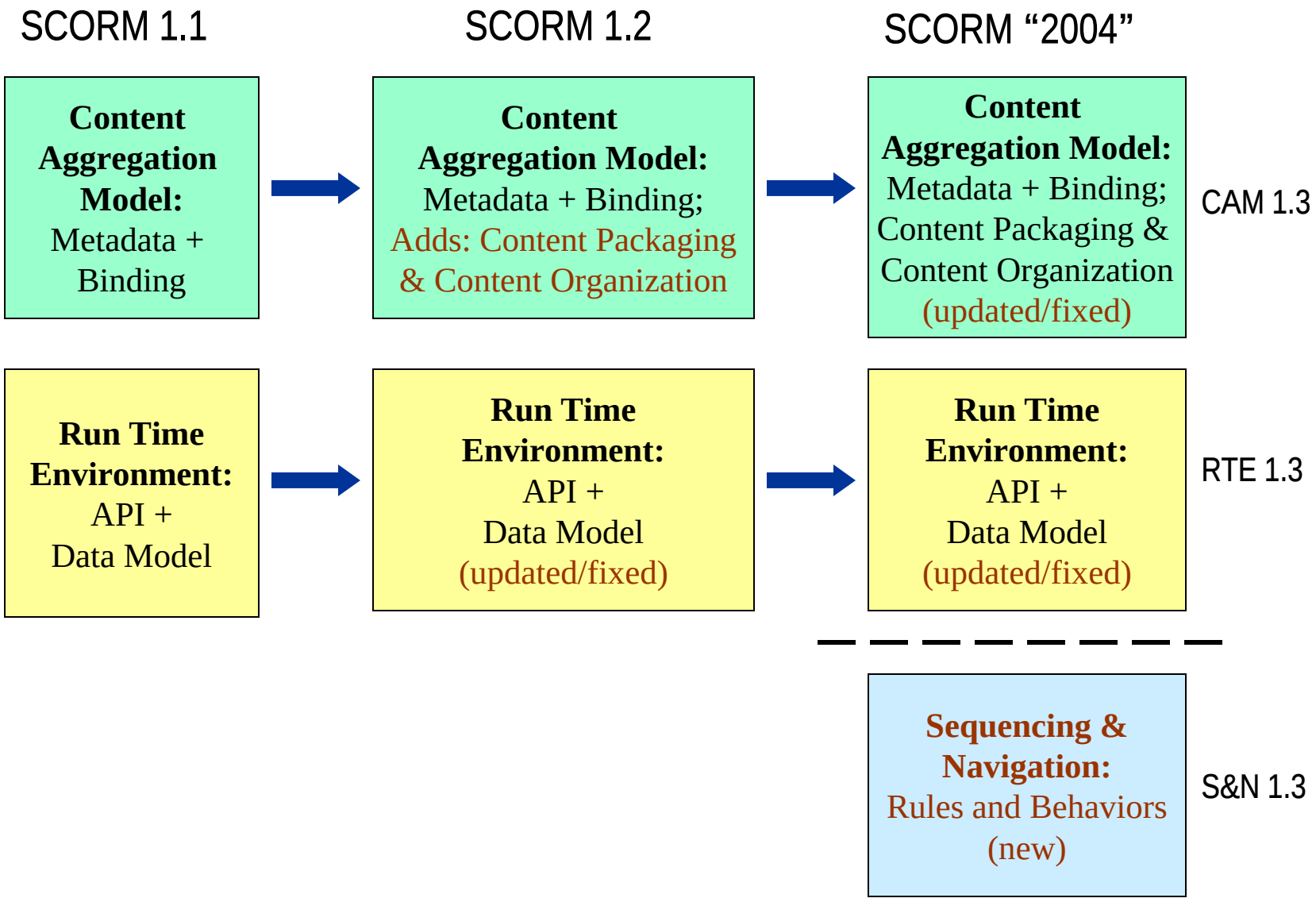
IMS Meetings
Early 2000

SCORM "2004" Released Jan 30, 2004

- This is an important "stabilization" point
- The "books" of SCORM will be independently maintained
- No major feature additions planned for the near future
- ADL will continue to support and maintain SCORM

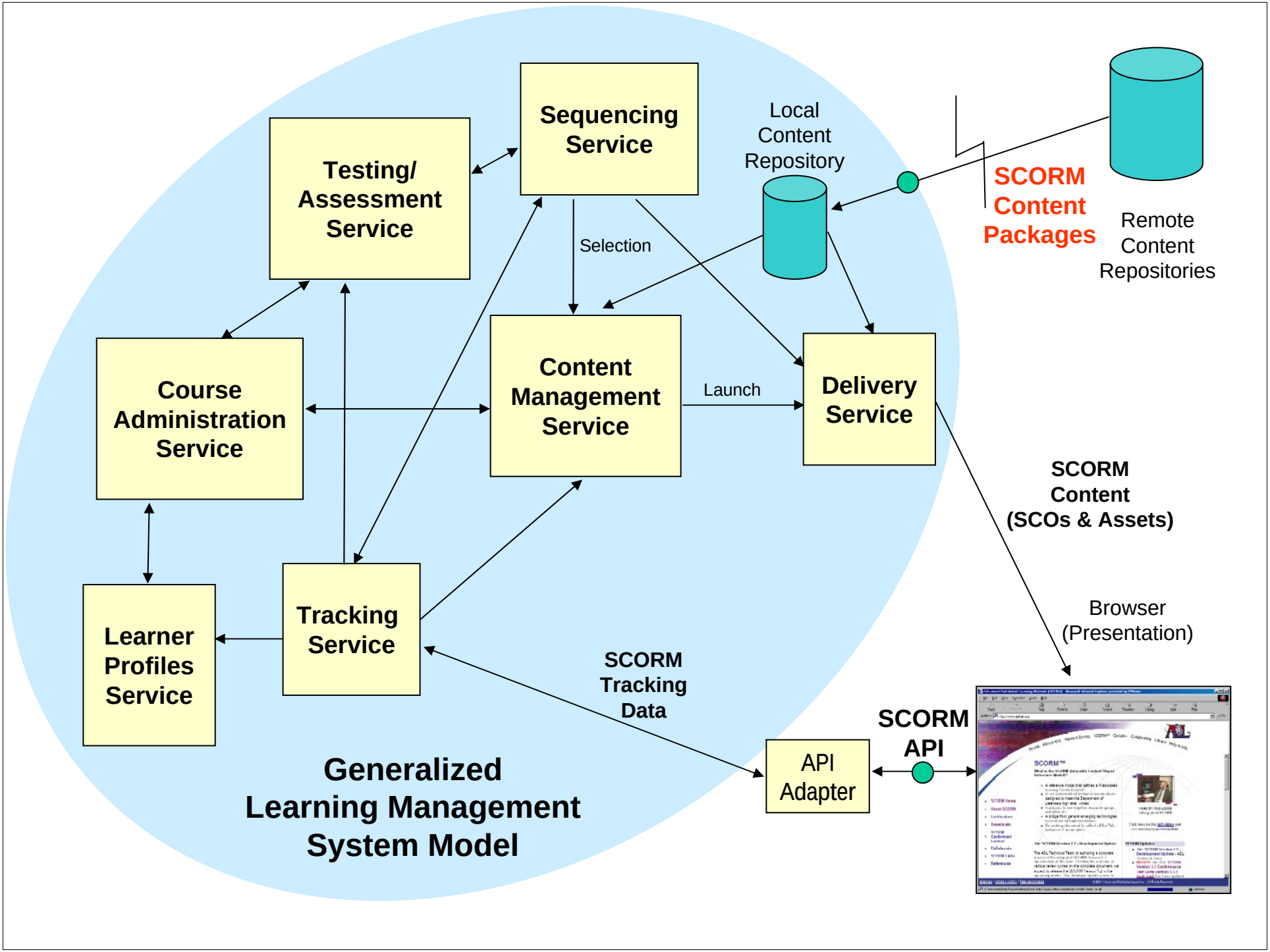

SCORM®
Sharable Content Object Reference Model
SCORM 2004 Overview
JANUARY 30, 2004
SCORM®
Sharable Content Object Reference Model
SCORM Run-Time Environment
Version 1.3
JANUARY 30, 2004
SCORM®
Sharable Content Object Reference Model
SCORM Content Aggregation Model
Version 1.3
JANUARY 30, 2004
ADVANCED DISTRIBUTED LEARNING
SCORM®
Sharable Content Object Reference Model
SCORM Sequencing and Navigation
Version 1.3
JANUARY 30, 2004
ADVANCED DISTRIBUTED LEARNING

SCORM Evolution

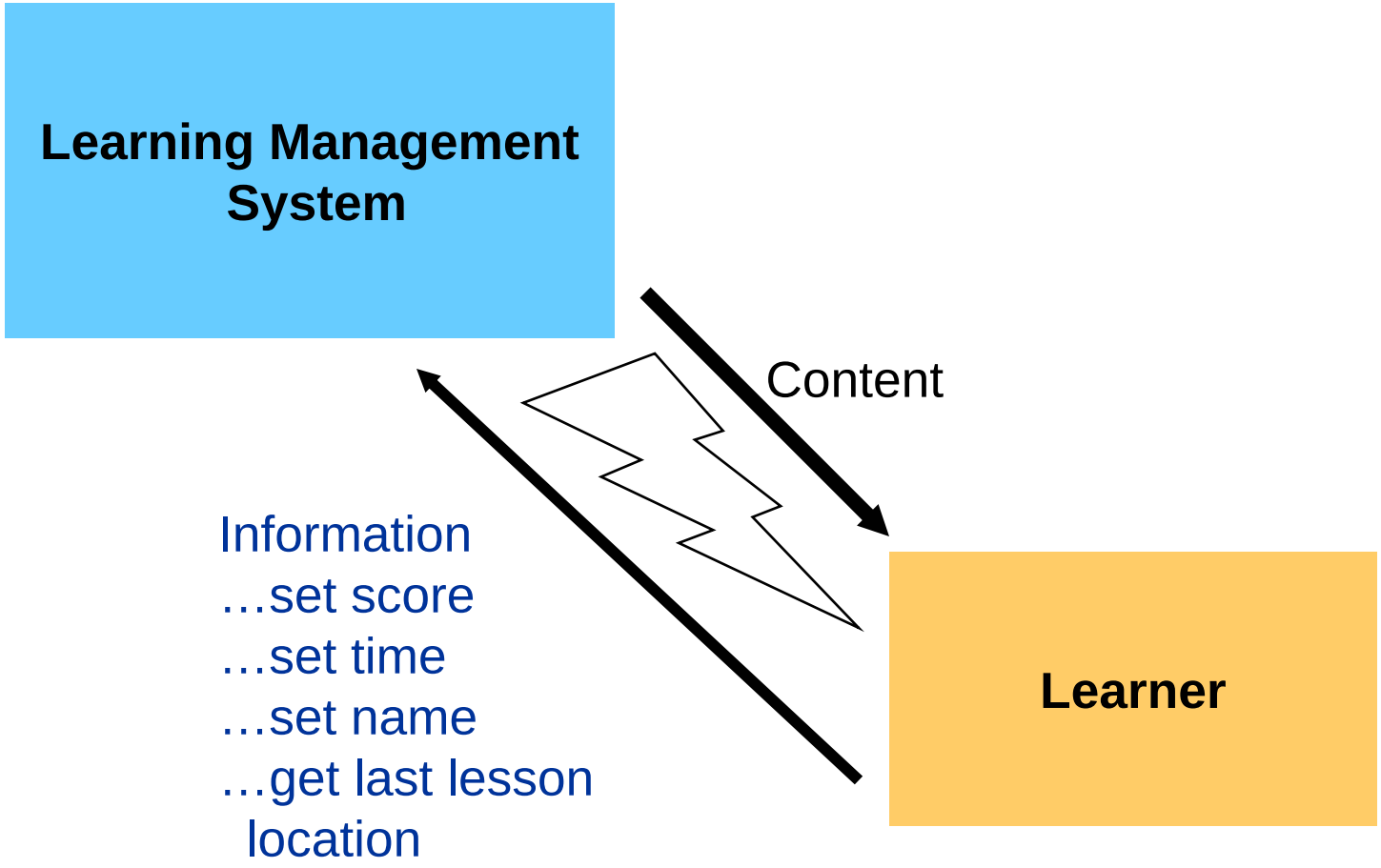


SCORM 2004 Does Many Things...

- SCORM gives us many things
  - An object-based approach for developing delivering instructional content
  - Interoperability of these objects across multiple delivery environments
  - The ability to craft sophisticated learning strategies based on the learner's mastery and progress
  - The means to package learning content and instructional strategies for import and export
  - The means to tag content so it may be found


Sequencing Service
Testing/ Assessment Service
Local Content Repository
SCORM Content Packages
Remote Content Repositories
Selection
Course Administration Service
Content Management Service
Launch
Delivery Service
SCORM Content (SCOs & Assets)
Learner Profiles Service
Tracking Service
Browser (Presentation)
SCORM Tracking Data
SCORM API
API Adapter
Generalized Learning Management System Model

Tracking The Learner



Adoption Looks Good So Far

- 32 LMS's certified SCORM 1.2 since February 2003; 8 more in the pipeline
- International adoption stronger than expected
- Adoption in education stronger than expected

- Parts of SCORM are now accredited standards (IEEE); more in the works
- It is an ADL goal that all SCORM specifications become accredited standards
- Increasing number of development and deployment success stories

Navy Systems Matrix

Oil-Carrying Systems (Lessons)

Ship Class	Fuel Oil Fill and Transfer (FOFT)	Fuel Oil Service (FOS)	Lube Oil Fill and Transfer (LOFT)	Lube Oil Service (LOS)	Aviation Fuel Fill and Transfer (AFFT)	Aviation Fuel Service (AFS)	Oily Waste Transfer and Storage (OWTS)	Main Drainage (MD)
DDG-51 CG-47	FOFT	FOS	LOFT	LOS	AFFT	AFS	OWTS	MD
FFG-7	FOFT	FOS	LOFT	LOS	AFFT	AFS	OWTS	MD
CV-63/64	FOFT	FOS	LOFT	LOS	AFFT	AFS	OWTS	MD
CV-67	FOFT	FOS	LOFT	LOS	AFFT	AFS	OWTS	MD
CVN-65	FOFT	FOS	LOFT	LOS	AFFT	AFS	OWTS	MD
CVN-68					AFFT	AFS		MD
LSD-41					AFFT	AFS		MD
LSD-49	FOFT	FOS	LOFT	LOS	AFFT	AFS	OWTS	MD
LHA-1	FOFT	FOS	LOFT	LOS	AFFT	AFS	OWTS	MD
LHA-2	FOFT	FOS	LOFT	LOS	AFFT	AFS	OWTS	MD
LHD-1	FOFT	FOS	LOFT	LOS	AFFT	AFS	OWTS	MD
LHD-7	FOFT	FOS	LOFT	LOS	AFFT	AFS	OWTS	MD
LCC-19/20	FOFT	FOS	LOFT	LOS	AFFT	AFS	OWTS	MD
AOE-1	FOFT	FOS	LOFT	LOS			OWTS	MD
AS-39/40	FOFT	FOS	LOFT	LOS			OWTS	MD
ARS-50	FOFT	FOS	LOFT	LOS			OWTS	MD
AGF-3/11	FOFT	FOS	LOFT	LOS			OWTS	MD
LPD-4	FOFT	FOS	LOFT	LOS	AFFT	AFS	OWTS	MD
MHC-51	FOFT	FOS		LOS	AFFT	AFS	OWTS	MD
MCM-1	FOFT	FOS	LOFT				OWTS	MD
PC-1	FOFT	FOS	LOFT	LOS			OWTS	MD
	FOFT	FOS					OWTS	MD

Enterprise Exemplars

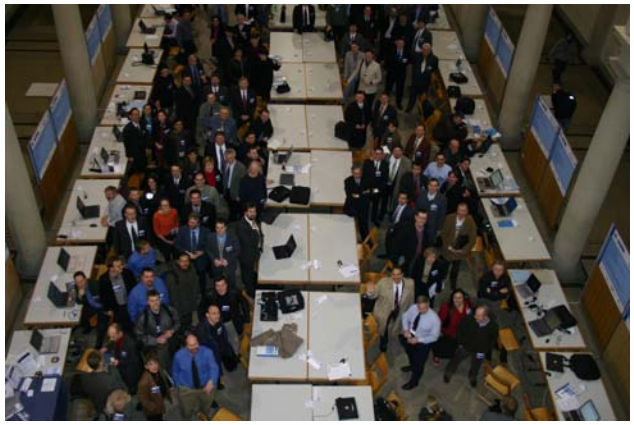
Org	Users	Learning Content*	Standards	Usage
Oracle	600k	450,000 objects	SCORM, QTI, EP	6k/day
UFI	900k	900 courses	SCORM, LOM, CMI, QTI, LIP	50k/day
Cisco	100k	1,400,000 objects	SCORM, LOM	
MSFT	80k	1,000,000 objects	SCORM, LOM, QTI, CP	50k/day
HP	160k	5,000 courses	SCORM, QTI, AICC	5k/day
Sun	30k		SCORM, AICC	

* courses/objects – cataloged, tagged and searchable

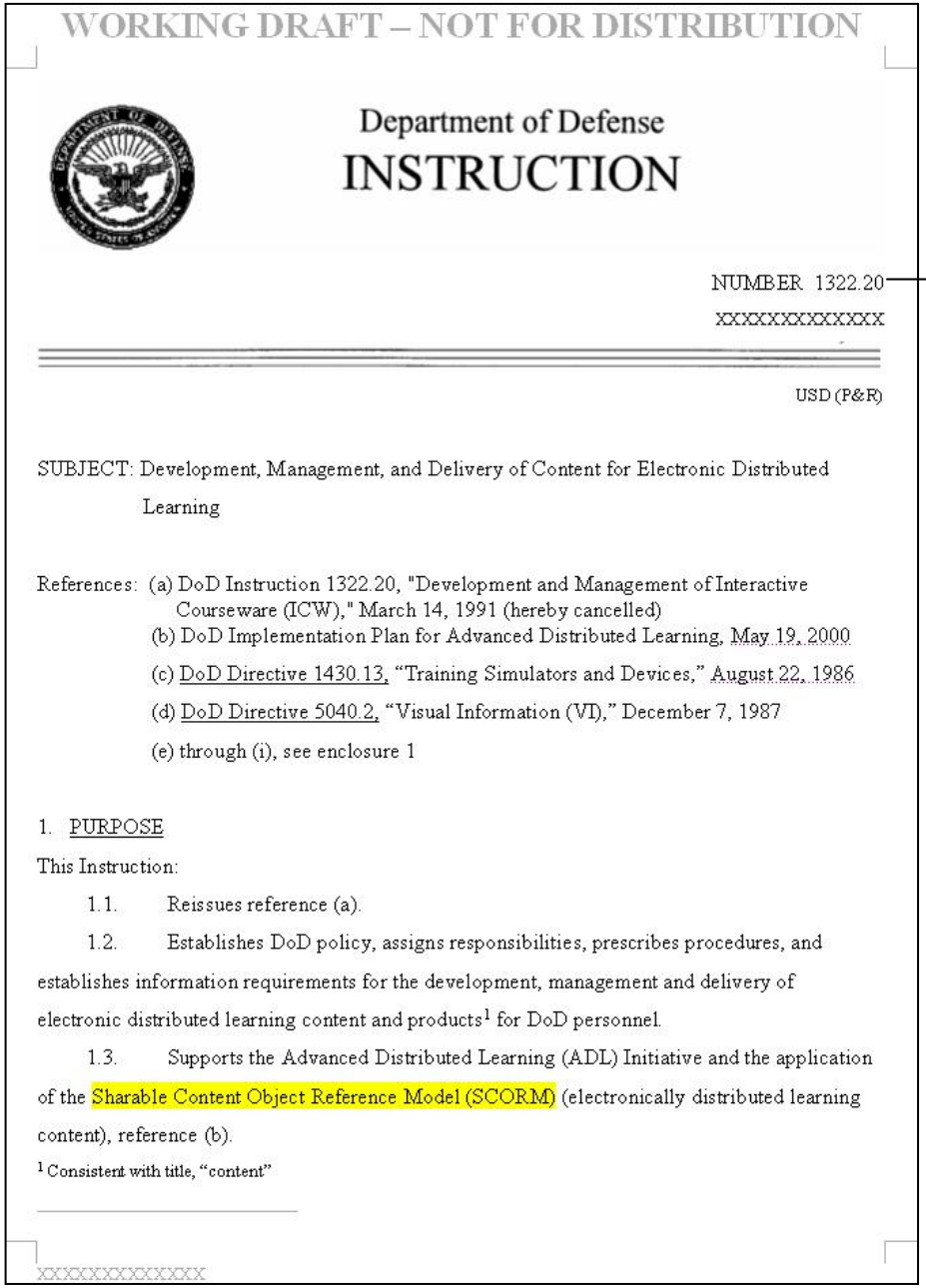
International Plugfest 1

- Over 320 participants
- 210 organizations
- 37 Countries
- Plug and Play area
  - 77 organizations participated
  - demonstrating more than 120 products including authoring tools, content examples, and learning management systems.

International Plugfest
ETH Zurich, Switzerland



ADL – SCORM: DoD Policy



WORKING DRAFT – NOT FOR DISTRIBUTION

Department of Defense

INSTRUCTION

NUMBER 1322.20

XXXXXXXXXXXXX

USD (P&R)

SUBJECT: Development, Management, and Delivery of Content for Electronic Distributed Learning

References: (a) DoD Instruction 1322.20, "Development and Management of Interactive Courseware (ICW)," March 14, 1991 (hereby cancelled)
(b) DoD Implementation Plan for Advanced Distributed Learning, May 19, 2000
(c) DoD Directive 1430.13, "Training Simulators and Devices," August 22, 1986
(d) DoD Directive 5040.2, "Visual Information (VI)," December 7, 1987
(e) through (i), see enclosure 1

1. PURPOSE

This Instruction:

1.1. Reissues reference (a).

1.2. Establishes DoD policy, assigns responsibilities, prescribes procedures, and establishes information requirements for the development, management and delivery of electronic distributed learning content and products[1] for DoD personnel.

1.3. Supports the Advanced Distributed Learning (ADL) Initiative and the application of the Sharable Content Object Reference Model (SCORM) (electronically distributed learning content), reference (b).

[1] Consistent with title, "content"

XXXXXXXXXXXXX

→ **DODI 1322.XX**

When do you need SCORM?

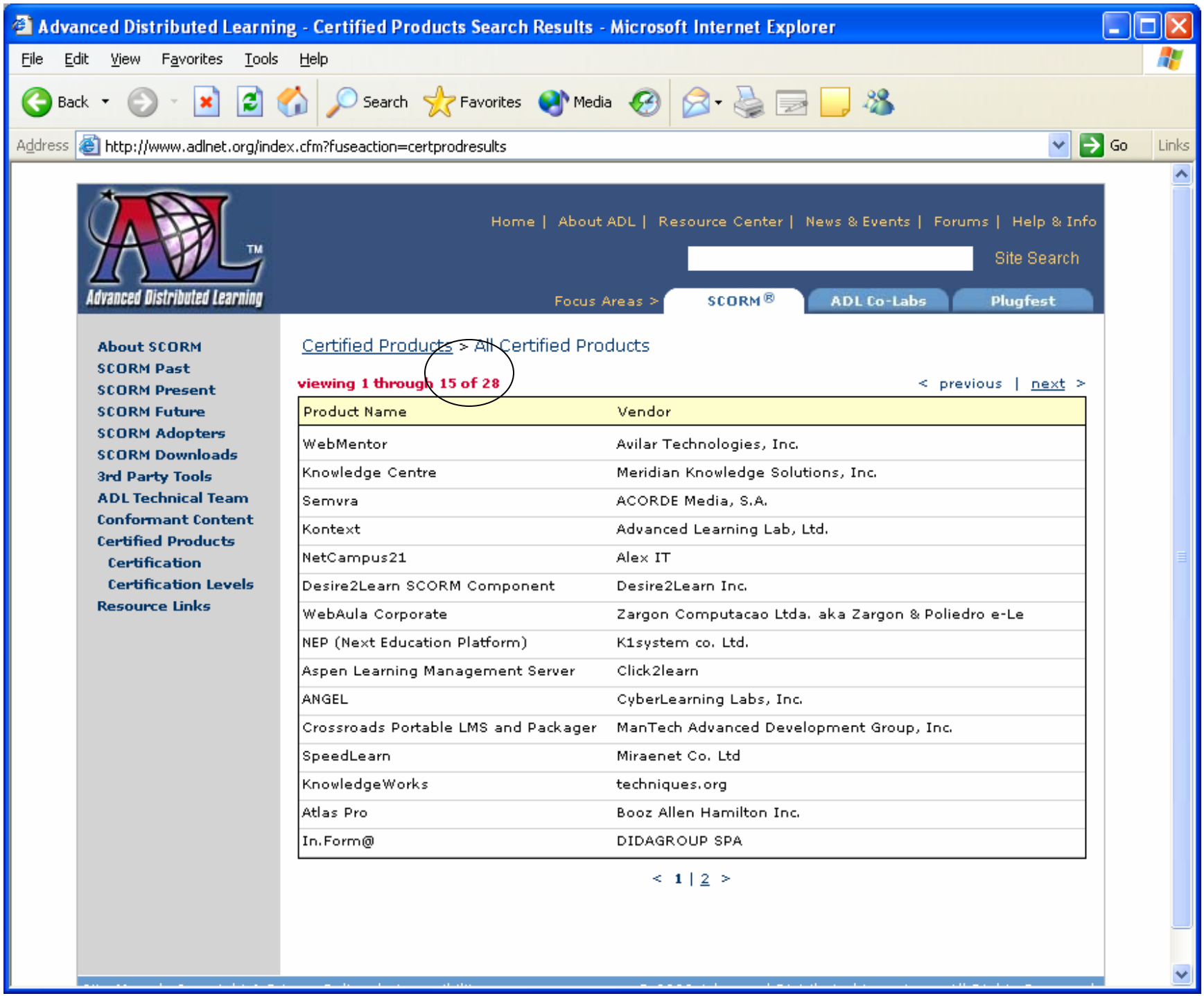
You do want to be SCORM (1.3) conforming if:

1. You want to design learning content that tracks learner performance and progress and adapts accordingly.
2. You plan to use an L(C)MS to deliver and manage learning content.
3. You are designing content that might be reused in other learning contexts
4. You want to create a library of learning objects
5. You want to be able to import and run SCORM content from other sources in addition to your own content (e.g., COTs courses or from other services).

You probably don't need to be SCORM conforming if:

1. The content is short lived and won't be reused
2. You never plan to use an L(C)MS to deliver and track content
3. You do not have content that has complex behaviors such as remediation.
4. You want only simple, static, hyperlinked content as reference material

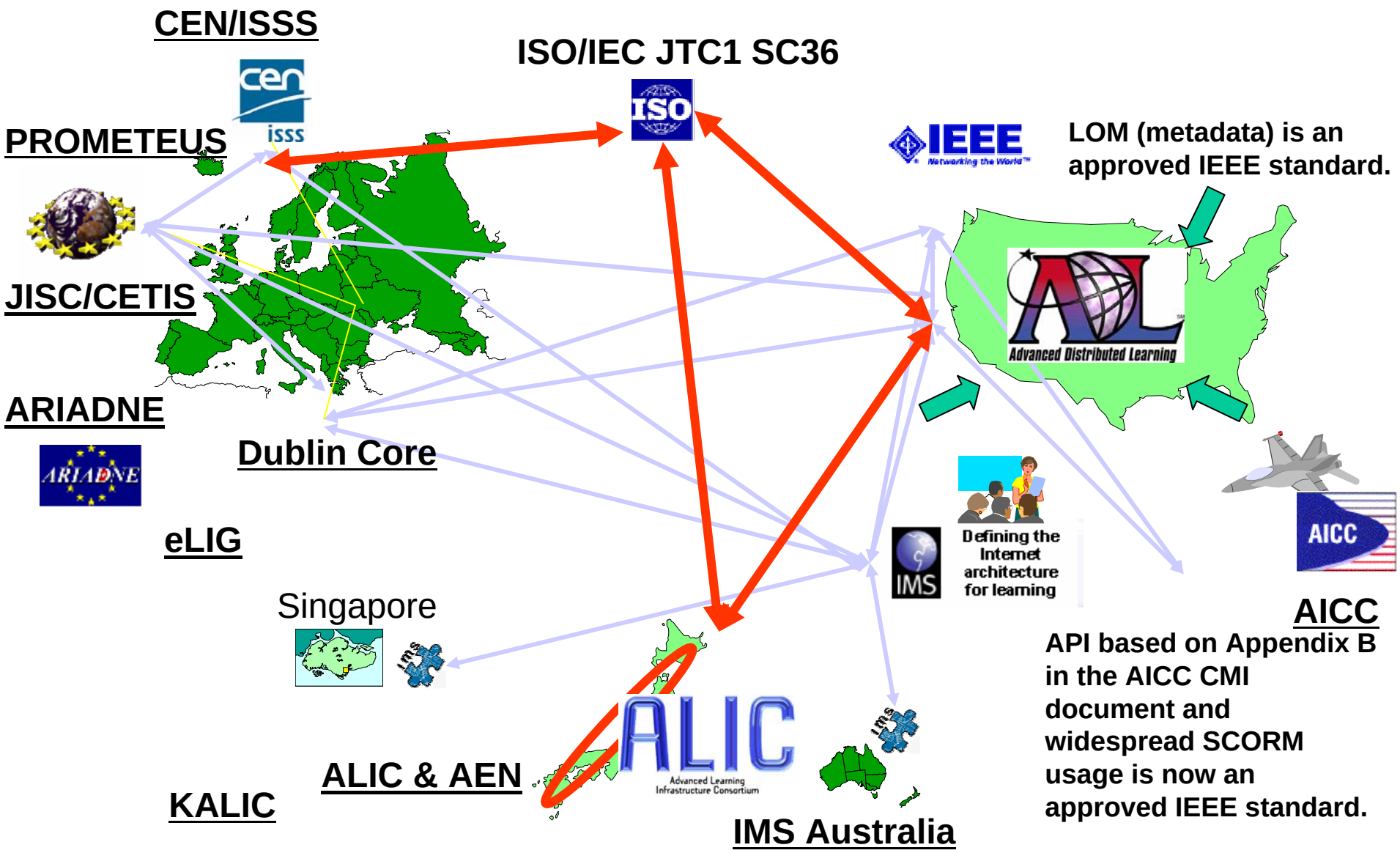

Advanced Distributed Learning - Certification - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
Address http://www.adlnet.org/index.cfm?fuseaction=scormcert
Go Links
Advanced Distributed Learning
Home | About ADL | Resource Center | News & Events | Forums | Help & Info
Site Search
Focus Areas > SCORM® ADL Co-Labs Plugfest
About SCORM
SCORM Past
SCORM Present
SCORM Future
SCORM Adopters
SCORM Downloads
3rd Party Tools
ADL Technical Team
Conformant Content
Certified Products
Certification
Certification Levels
Resource Links
Certification
ADL Certification Program
November 2003
ADL Certification
The ADL Certification program is a third party testing of tools and content by a Department of Defense (DoD) designated ADL Certification Testing Center. The ADL Certification Testing Centers use the latest SCORM Conformance Test Suite software as the primary basis of certification. Additionally, the ADL Certification Testing Centers may also impose added requirements for certification.
The Alexandria ADL Co-Laboratory signed a Memorandum of Understanding (MOU) in November 2002 with the following designated ADL Certification Testing Centers:
Wisconsin Testing Organization - Madison, Wisconsin
Judy Brown, Certification Testing Center Administer
certify@academiccolab.org
Naval Undersea Warfare Center (NUWC) Keyport - Keyport, Washington
Virginia Mesenbrink, Certification Testing Center Administer
mesenbrink@kpt.nuwc.navy.mil
Certification is independent testing that provides consumers of distributed learning products and content with the assurance that certified products have successfully implemented the SCORM. Certification is not an endorsement from the ADL Initiative or a guarantee that the product and/or content has been tested for defects in functionality and/or the product's content is instructionally sound.
General questions or comments regarding certification can be submitted to the ADL Technical Team through the Help & Info section.


Advanced Distributed Learning - Certified Products Search Results - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
Address http://www.adlnet.org/index.cfm?fuseaction=certprodresults
Go Links
Advanced Distributed Learning
Home | About ADL | Resource Center | News & Events | Forums | Help & Info
Site Search
Focus Areas > SCORM® ADL Co-Labs Plugfest
About SCORM
SCORM Past
SCORM Present
SCORM Future
SCORM Adopters
SCORM Downloads
3rd Party Tools
ADL Technical Team
Conformant Content
Certified Products
Certification
Certification Levels
Resource Links
Certified Products > All Certified Products
viewing 1 through 15 of 28
< previous | next >
Product Name Vendor
WebMentor Avilar Technologies, Inc.
Knowledge Centre Meridian Knowledge Solutions, Inc.
Semvra ACORDE Media, S.A.
Kontext Advanced Learning Lab, Ltd.
NetCampus21 Alex IT
Desire2Learn SCORM Component Desire2Learn Inc.
WebAula Corporate Zargon Computacao Ltda. aka Zargon & Poliedro e-Le
NEP (Next Education Platform) K1system co. Ltd.
Aspen Learning Management Server Click2learn
ANGEL CyberLearning Labs, Inc.
Crossroads Portable LMS and Packager ManTech Advanced Development Group, Inc.
SpeedLearn Miraenet Co. Ltd
KnowledgeWorks techniques.org
Atlas Pro Booz Allen Hamilton Inc.
In.Form@ DIDAGROUP SPA
< 1 | 2 >

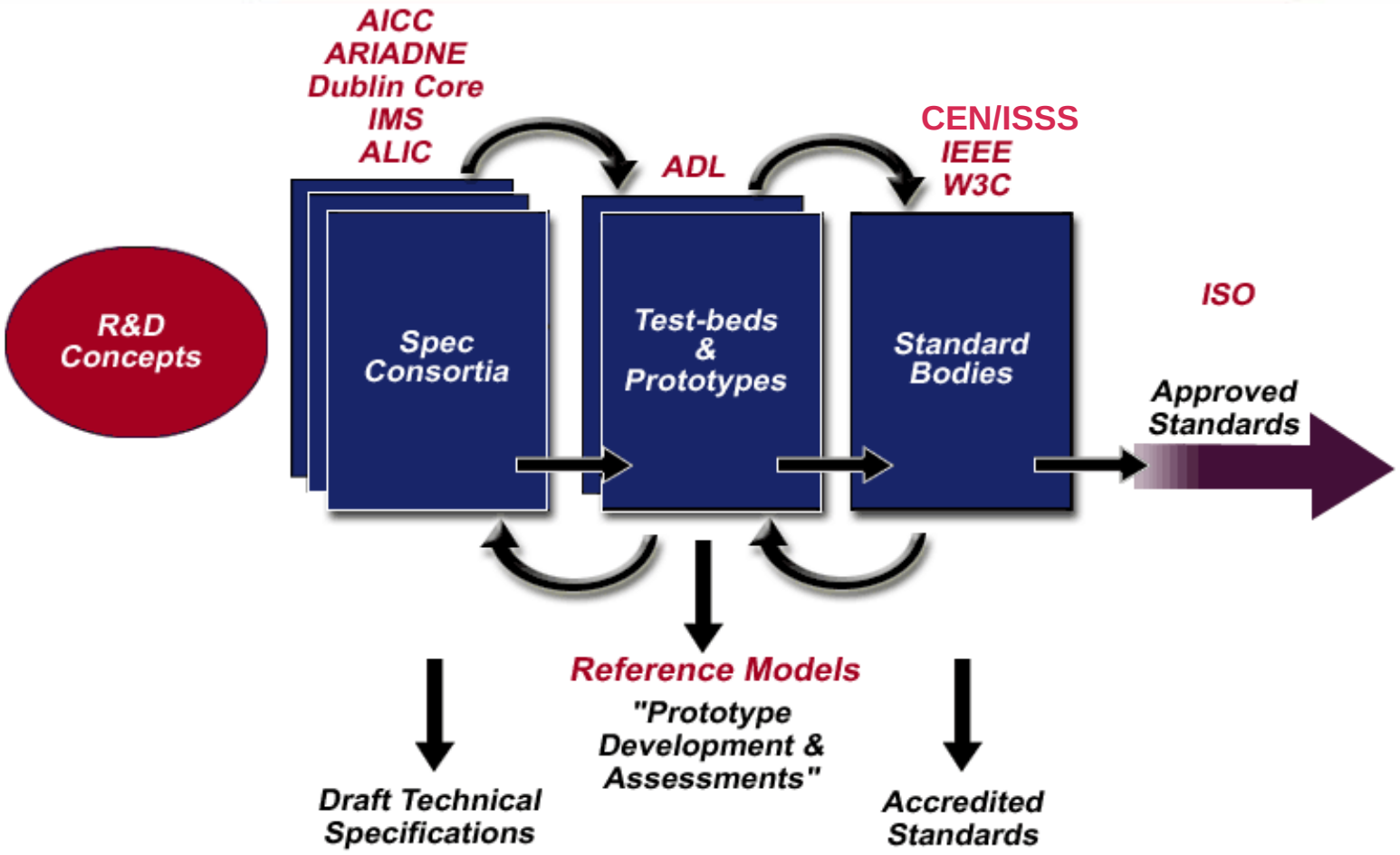
Six Year Progress Report

1998 Conditions	2004 Conditions
No interoperable eLearning content standards	SCORM 1.2, tested and with conformance test software; SCORM 2004 Released Jan 30, 2004
No standards group agreement (AICC, IEEE, IMS, ARIADNE, etc).	ADL brokered agreement on process and flow among all groups
No industry consensus	Strong SCORM support by industry (e.g., International Plugfest 1)
Concern about support of ADL Initiative	Strong support for ADL leadership and SCORM process (DoD Policy)
No advanced work on next generation architectures	ADL Funded/supported key research at CMU; harmonizing with MIT OKI work, supporting prototypes
ADL's role unclear to many	ADL viewed as "key" accelerator/catalyst

ADL Resulting in a World Wide Community for Learning Technology



ADL Model for Standards Evolution



Implementation of SCORM

	Current LMS	Future LMS
• Army (ATSC/TRADOC)	SABA/Click2Learn	? OLMS
• Navy (CNET)	THINQ	THINQ
• Air Force	Plateau, Meridian KSI	? Under study
• Marines	Self Developed	THINQ
• DAU	Self Developed (OSS)	Atlas Pro
• USDA Grad School	Self Developed	? Under study
• IRS	None	Plateau
• CDC	Self Developed	? Under study
• NDU	Blackboard	Blackboard
• OPM (eGov)	GeoLearning	GeoLearning

ADL will expand its work...

Creating a model for sharable learning objects is great, but how good is it if you can't find and retrieve them when you need to?

We need the means to store, index, search and retrieve content at scale

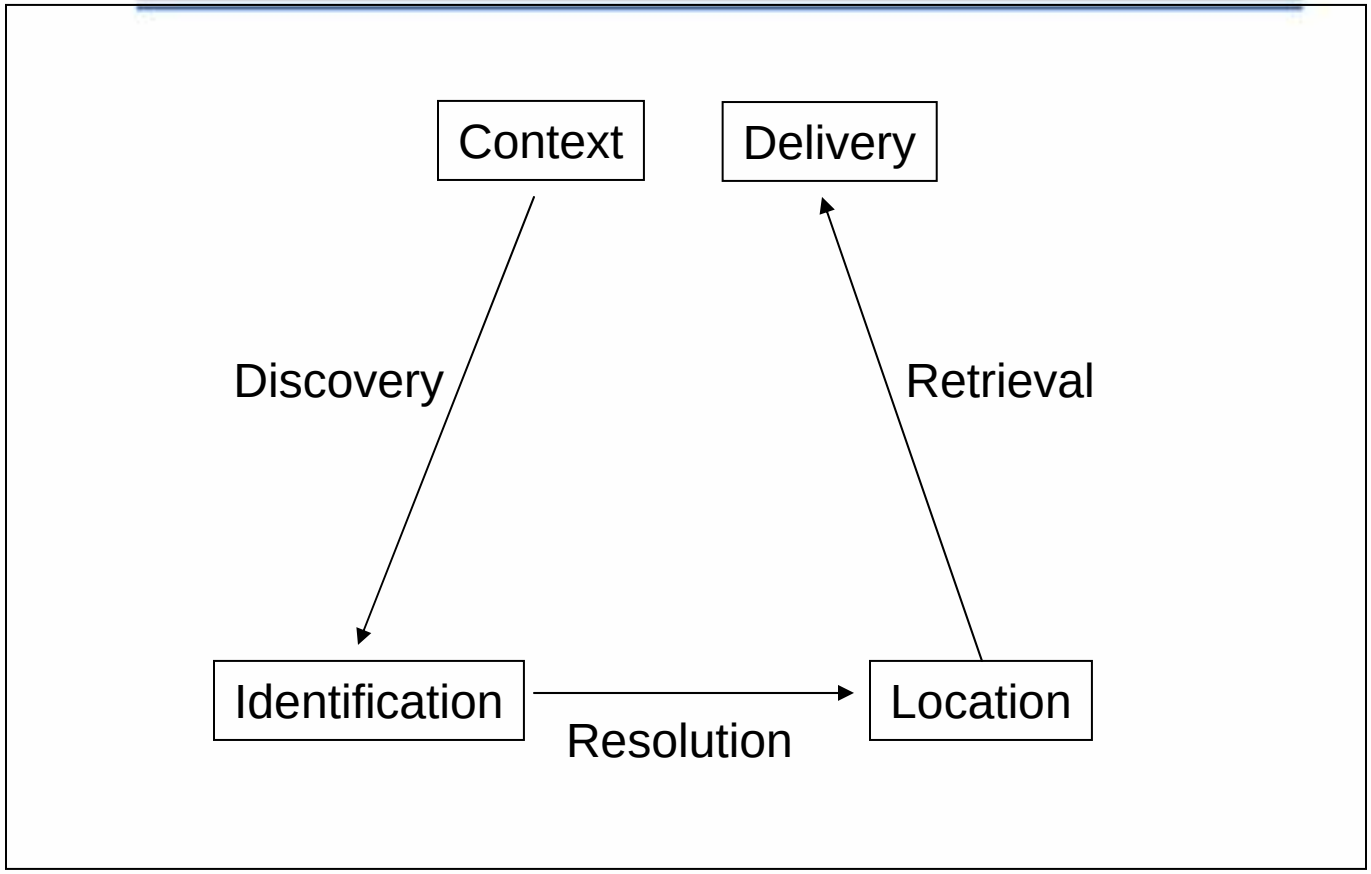
ADL Will focus next on integrated frameworks to enable these functions

Working Title

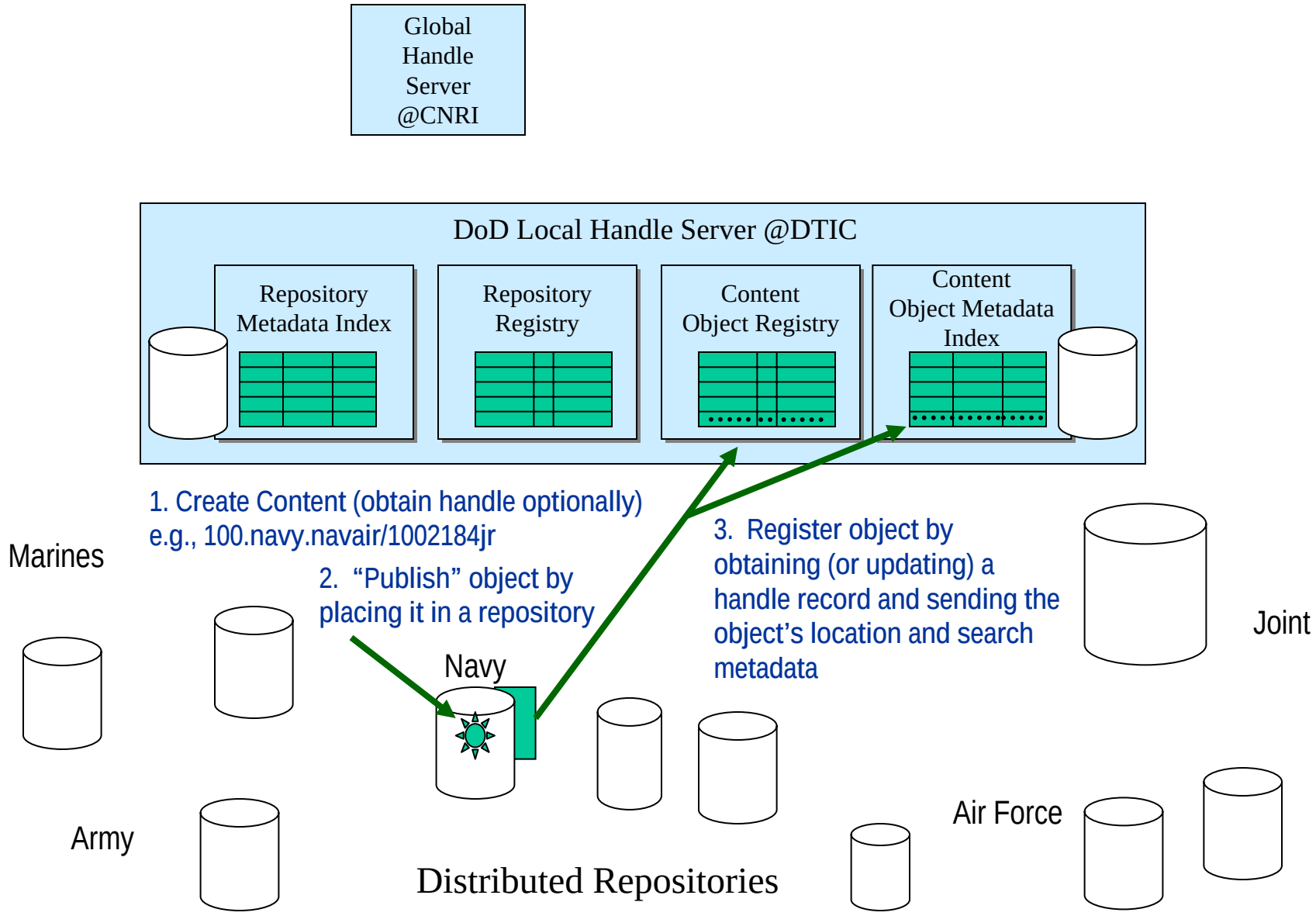
Content Object Repository Discovery and Resolution Architecture

“CORDRA”

CORDRA


Context
Delivery
Discovery
Retrieval
Identification
Resolution
Location

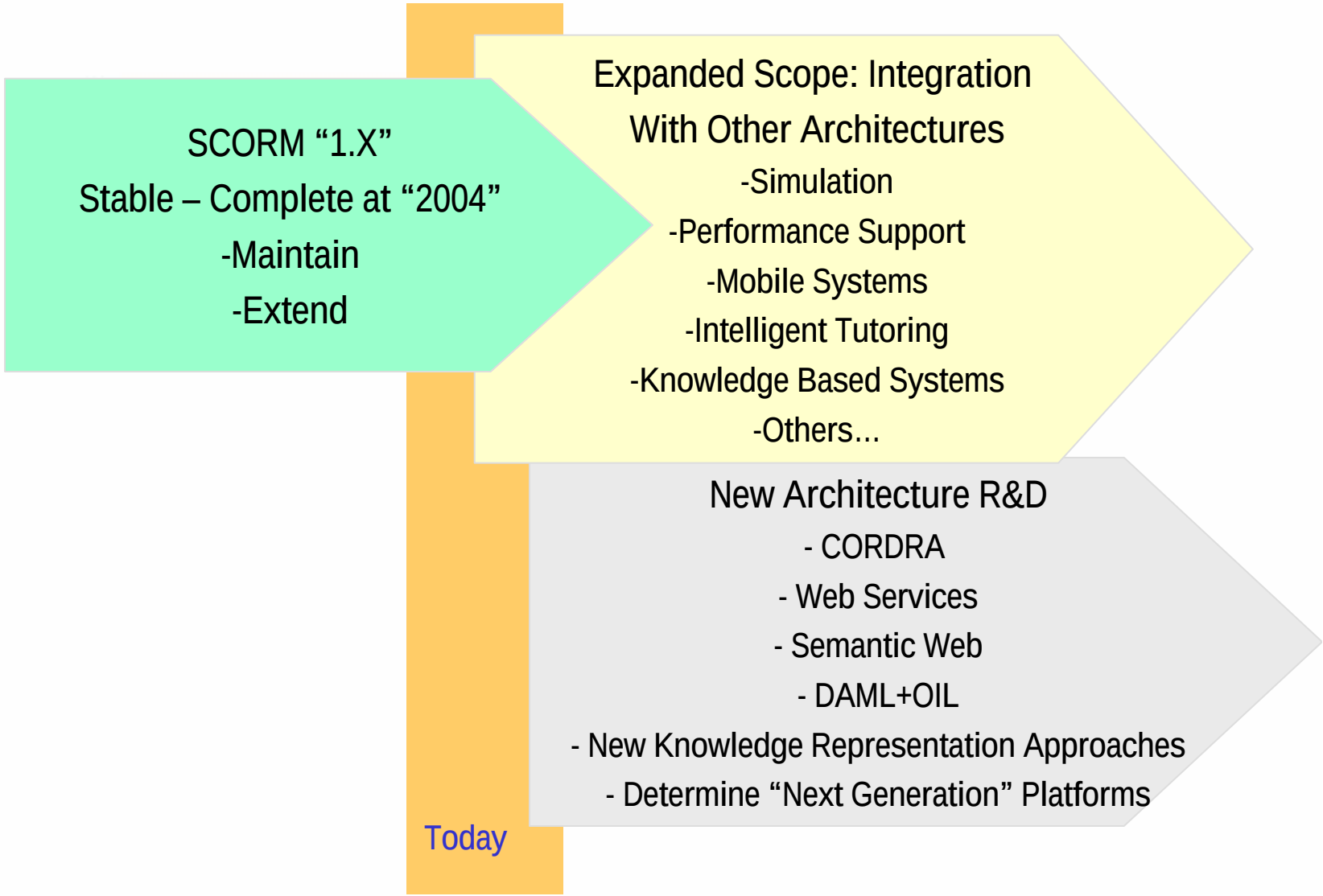
DoD CORDRA FRAMEWORK



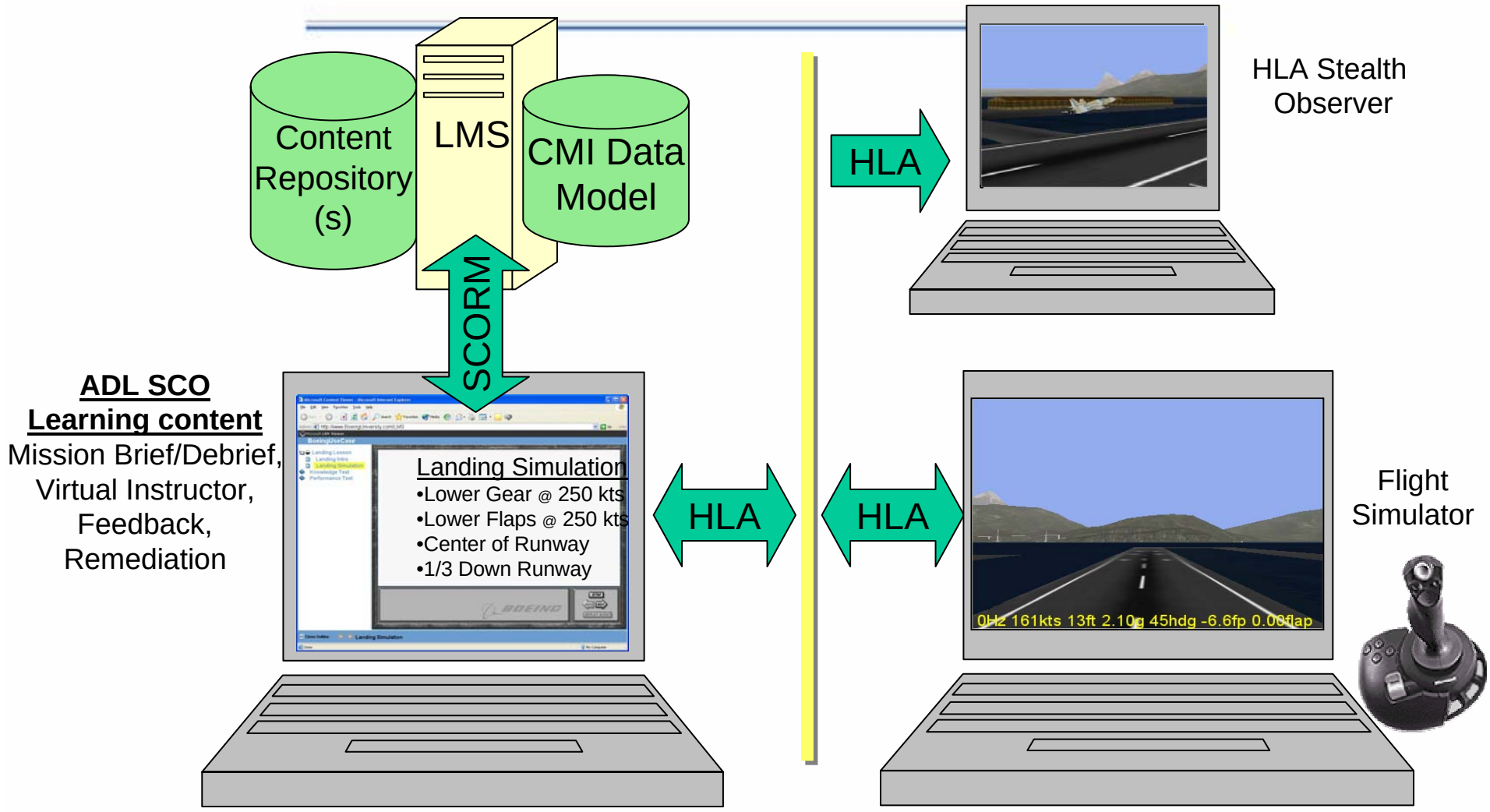
Some of the People we are working with

- CNRI (Corporation for National Research Initiatives)
- U.S. Library of Congress
- DTIC (Defense Technical Information Center)/CENDI
- U.S. Military Services
- NSF/NDSL
- IRS (Internal Revenue Service)
- GPO (Government Printing Office)
- U.K. TSO (The Stationary Office)
- Medbiquitous (Professional medical education consortium)
- Many others…

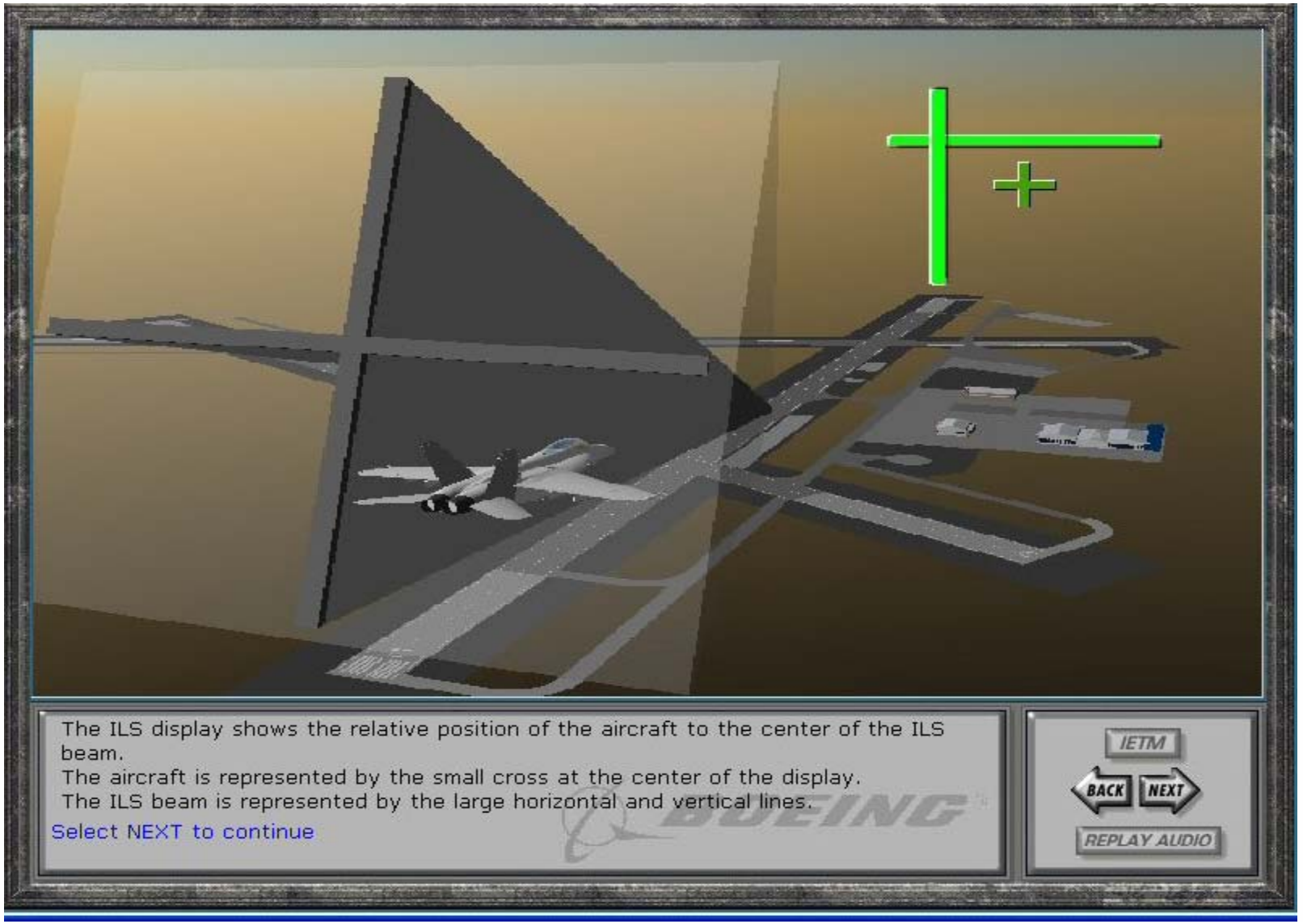
Phases Of SCORM Evolution



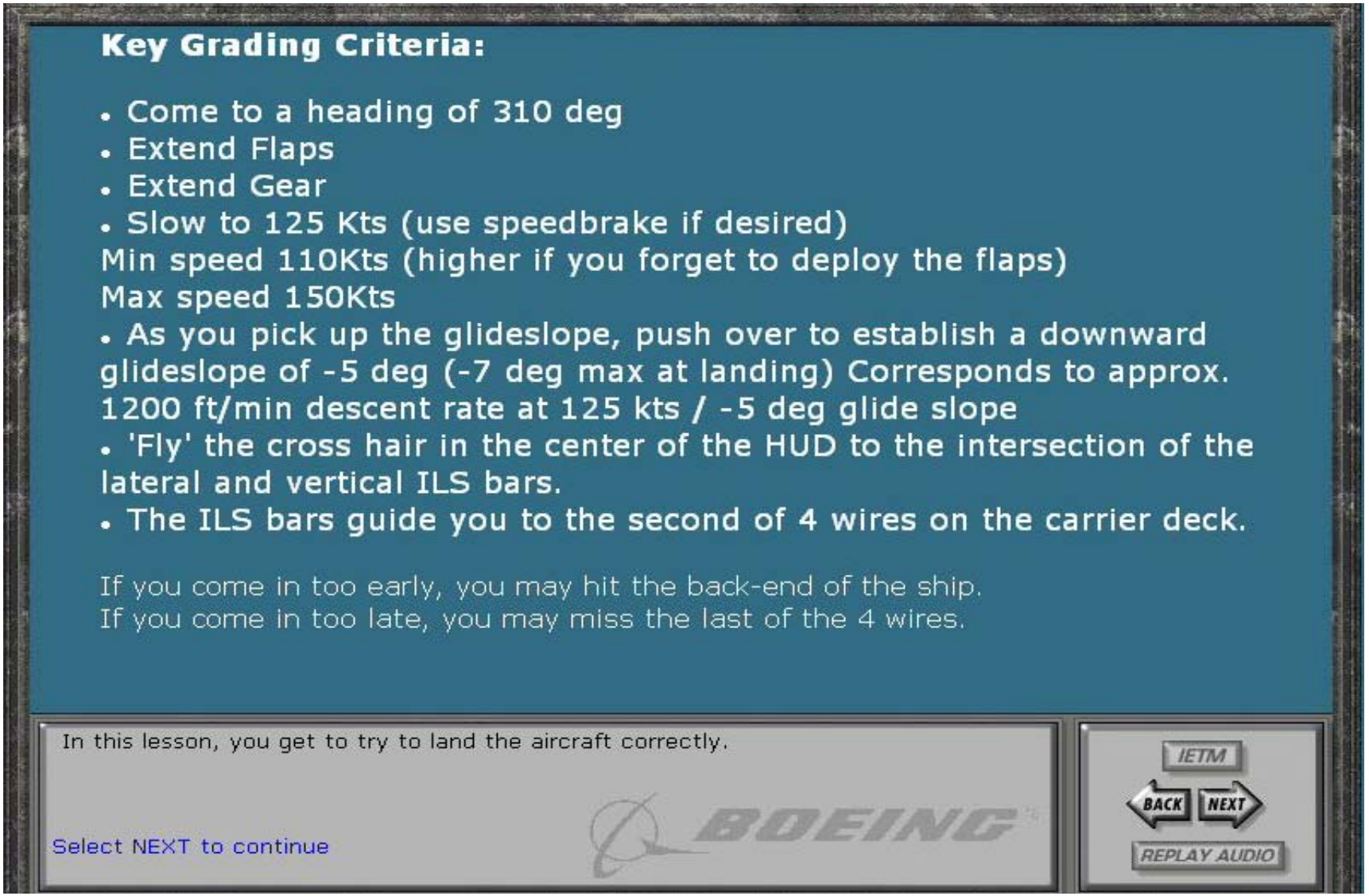
ADL SCORM / HLA Federate



Instructional SCO



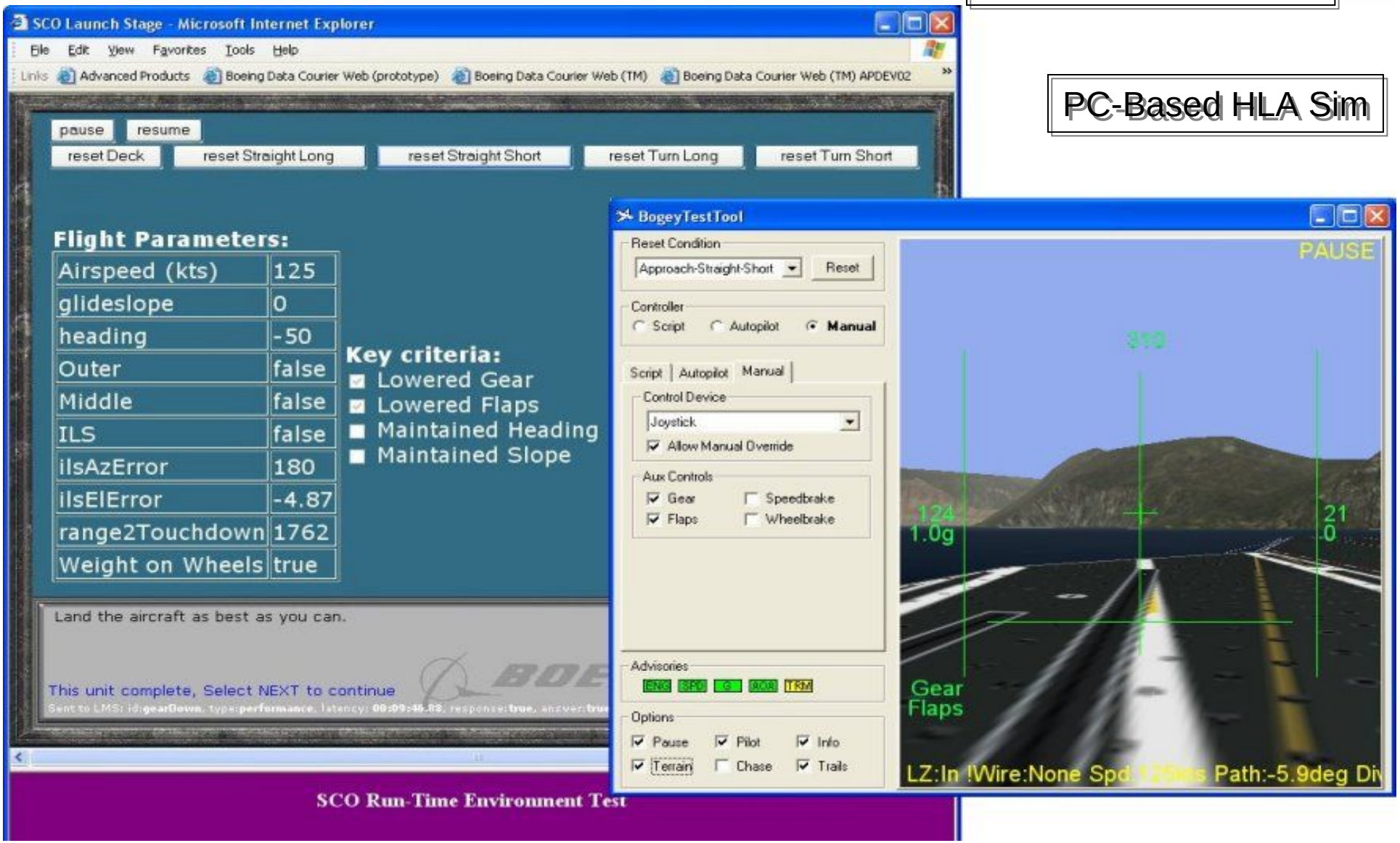
Preflight Brief



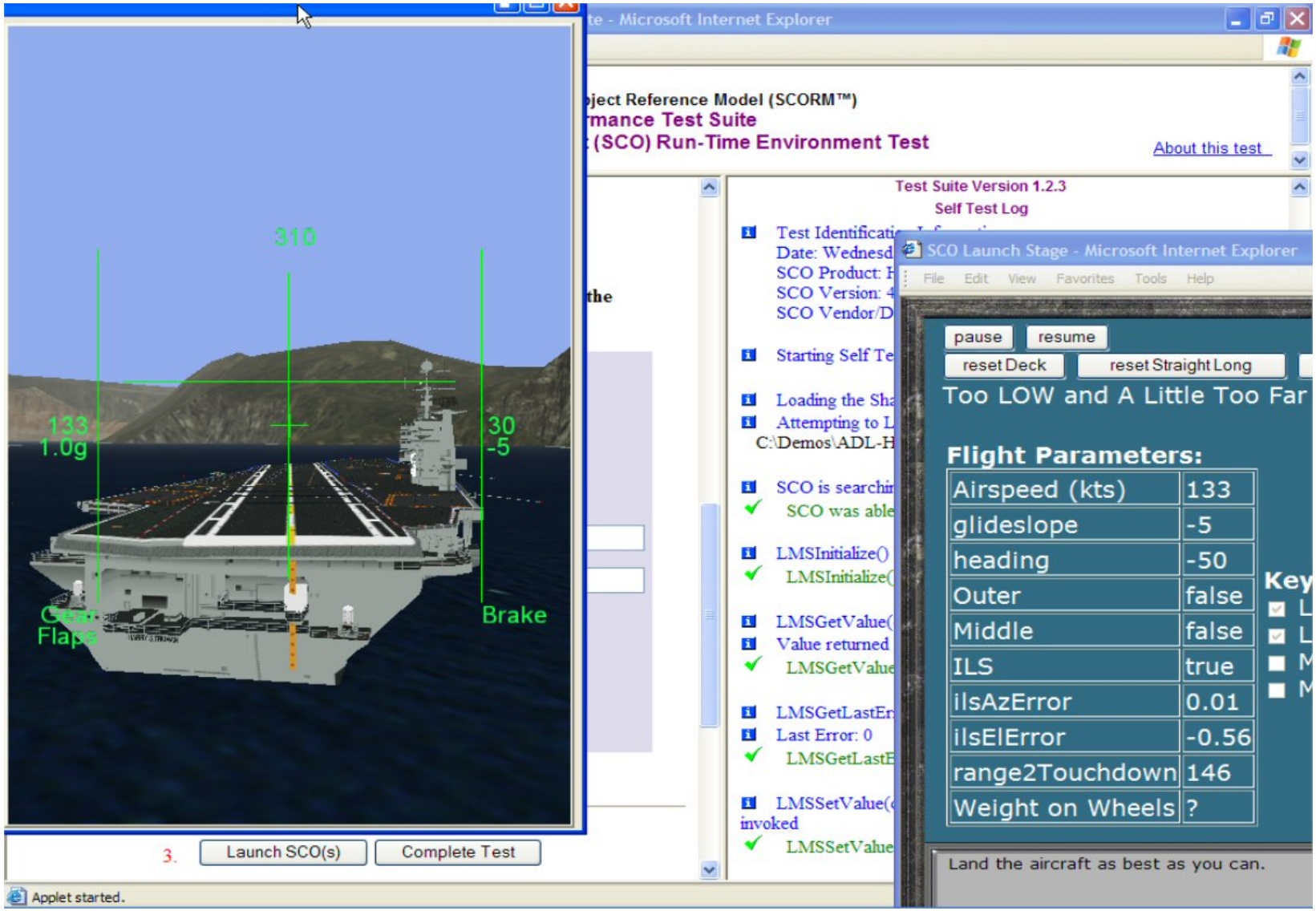
Demo Screen Shots

Virtual Instructor SCO

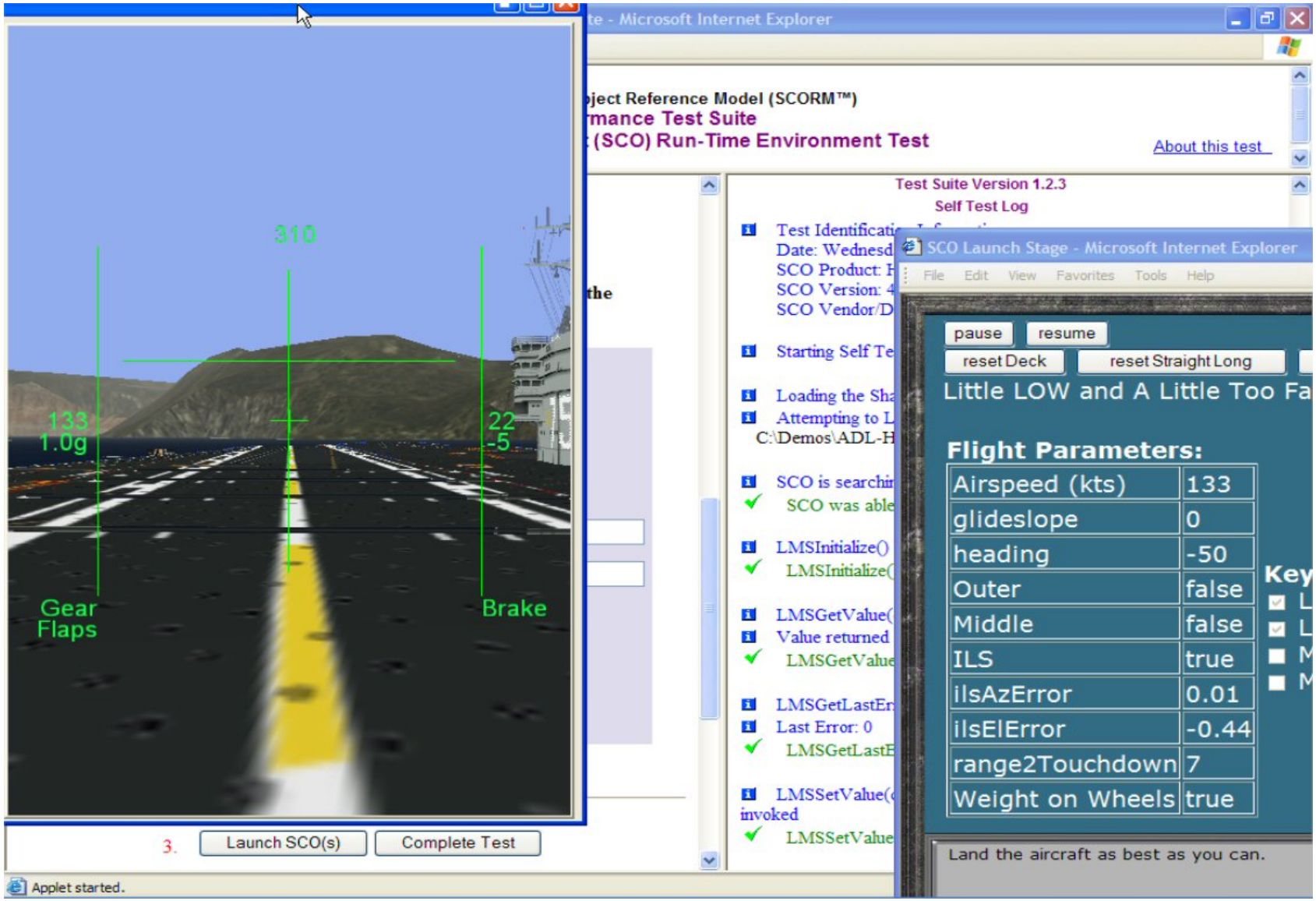
PC-Based HLA Sim



PC-Sim & Virtual Instructor SCO



Landed


310
133
1.0g
22
-5
Gear
Flaps
Brake
3.
Launch SCO(s)
Complete Test
Applet started.
te - Microsoft Internet Explorer
bject Reference Model (SCORM™)
rmance Test Suite
t (SCO) Run-Time Environment Test
About this test
Test Suite Version 1.2.3
Self Test Log
SCO Launch Stage - Microsoft Internet Explorer
File Edit View Favorites Tools Help
pause
resume
reset Deck
reset Straight Long
Little LOW and A Little Too Fa
Flight Parameters:
Airspeed (kts) 133
glideslope 0
heading -50
Outer false
Middle false
ILS true
ilsAzError 0.01
ilsElError -0.44
range2Touchdown 7
Weight on Wheels true
Land the aircraft as best as you can.

Scoring Debrief

Touchdown Scores

Parameter	Description	Desired	Result
On Runway	True if touched down on runway	true	true
Wire Caught	Which wire was grabbed (0 if none; 1=closest to leading edge, then 2,3,4=last wire)	2	0
Air Speed	Speed at touchdown (keas) 110 min, 150 max	125	125
Glide Slope	Flight path at touchdown (deg)	-5	-6
Distance From Target	Miss distance from ideal (ft)	0	71.5
Heading Error	Angle off runway heading (deg)	0	0
Dive Rate	Dive rate at touchdown (ft/min)	1200	1298
Flaps Down	True if flaps were down at touchdown	true	true
Gear Down	True if gear was down at touchdown	true	true

Here are the results of your landing.

Select NEXT to continue

BOEING

IETM

BACK NEXT

REPLAY AUDIO

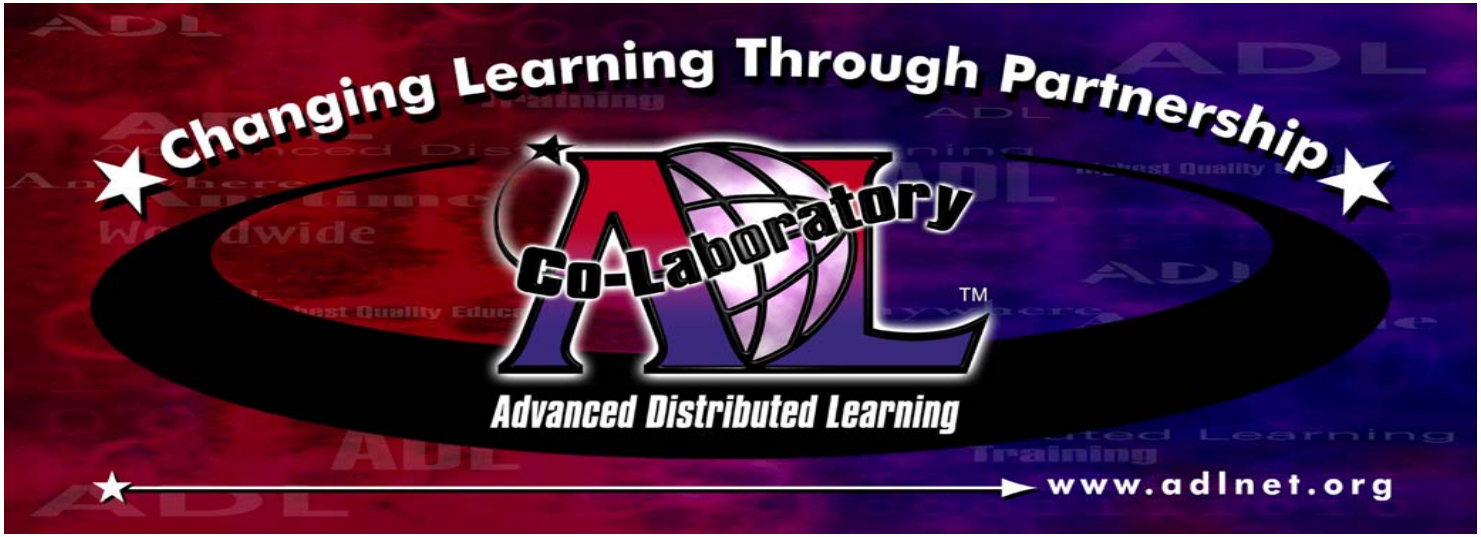
ADL – Future Directions

- **Continuing commitment by ADL Sponsors**
- **Stabilize @SCORM 2004 and plan next generation**
- **Registration of objects and repositories**
- **Integration with other technologies**

ADL – Integration and Research Areas

- **Content Object Repositories Discovery and Resolution Architecture (CORDRA)**
- **Simulations and High Level Architecture (HLA)**
- **Job Performance Technology (S1000D) – Mobile, wireless**
- **Intelligent Tutoring Systems**
- **Massive Multiplayer Online Games**
- **Web-services or other messaging technologies as Integration Technology**

Thank You



www.adlnet.org

Paul Jesukiewicz
703-575-4350
pjesukie@ida.org